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Remarks

This is responsive to the Office Action mailed October 16, 2006. The amendments and remarks are proper, do not introduce new matter, do not require additional searching, are not narrowing in view of a rejection over a cited reference, and serve to explain why the case is presently in condition for allowance.

Rejection Under Section 102

Claims 30-34, 36-42, 44-46, 53-56, and 58 stand rejected as being anticipated by US 2003/0041201 to Rauscher ("Rauscher '201" now US 6,874,100). This rejection is respectfully traversed.

Claim 30 - common enclosure

Rauscher does not identically disclose *a plurality of data storage devices and redundant storage controllers within a common enclosure* as recited by claim 30. Rather, Rauscher '201 expressly discloses separate enclosures for the data storage devices and the controllers:

The storage array controllers 175 and 275 are supported by and enclosed by chassis 100 and 200, respectively. Also supported and contained by chassis 100 and 200 are power supply and cooling systems 150 and 250, which serve storage array controllers 175 and 275, respectively with electrical power and cooling....

DASD chassis 300 supports and encloses DASD 310, 320, 330, 340, 370 and 380 and also supports and encloses DASD power supply and cooling system 350, which provides electrical power and cooling to the DASD enclosed in DASD chassis 300....

DASD chassis 400 supports and encloses DASD 410, 420, 430, 440, 470 and 480 and also supports and encloses DASD power supply and cooling system 450, which

provides electrical power and cooling to the DASD enclosed in DASD chassis 400.

DASD chassis 500 supports and encloses DASD 510, 520, 530, 540, 570 and 580 and also supports and encloses DASD power supply and cooling system 550, which provides electrical power and cooling to the DASD enclosed in DASD chassis 500.
(Rauscher '201 paragraphs [0052-0056], emphasis added)

Rauscher '201 encloses each controller and each channel of DASDs separately in accordance with its primary purpose, not merely some incidental outcome:

This invention relates to modular enclosures for components of redundant array of inexpensive disk (RAID) electronic data storage systems.
(Rauscher '201, paragraph [0004], emphasis added)

The term "module" is used to designate a self contained system component. A controller module consists of a chassis, a RAID controller, a power supply and a cooling system. Similarly, a DASD module consists of a DASD chassis plus the DASDs, a power supply, and a cooling system. Similarly, each cable used to connect one chassis with another chassis is a module.
(Rauscher '201, paragraph [0070], emphasis added)

None of the prior art references provide the advantages of the present invention, that of the reliability of operation associated with an independent backplane board, cables, power supply and cooling system for each controller and for each rack of DASD. . . The RAID systems of this invention eliminate the sharing of backplanes by more than one controller or more than one channel of DASD.
(Rauscher '201, paragraph [0025], emphasis added)

There is no question that Rauscher '201 encloses the data storage devices and the controllers separately in individual chassis 100, 200, 300, 400, 500, 600. Nevertheless, the Examiner views the data storage devices and controllers to be in a *common enclosure* because Rauscher '201 discloses placing each chassis 100, 200, 300, 400, 500, 600 on a different shelf 710, 720, 730, 740, 750, 760, respectively, of a rack 700. (Office Action of

10/16/2006, pg. 3) However, the Examiner provides no evidence that the rack 700 itself forms an enclosure. In fact, Rauscher '201 discloses the rack 700 is not an enclosure, because it is formed only of opposing vertical ends 705, 715 that are connected by the horizontal shelves 710, 720, 730, 740, 750, 760. In the absence of evidence in the record that the data storage devices and controllers are commonly enclosed, it can only be concluded that the rejection is based on a mischaracterization of what Rauscher '201 actually discloses.

Therefore, the Examiner's claim construction is unreasonably broad because it ignores the plain meaning of *common enclosure*, thereby effectively ignoring explicitly recited claim language. *In re Morris* 43 USPQ2d 1753 (Fed. Cir. 1997) The examination resulting in this rejection is incomplete with regard to the Examiner's obligation to consider the patentability of the invention as claimed. 37 CFR 1.104(a)(1). Also, because the rejection is based on ignoring an explicitly recited feature and mischaracterizing the cited reference, the Examiner does not provide a reason for the rejection that is useful in aiding Applicant to judge the propriety of continuing the prosecution. 37 CFR 1.104(a)(2)

The Examiner has failed to make the requisite prima facie case of anticipation by not substantiating evidence in the record that the cited reference identically discloses all the features recited by the language of claim 30. Therefore, any next rejection of claim 30 cannot be made final. Reconsideration and withdrawal of the rejection of claim 30 and the claims depending therefrom are respectfully requested.

Claims 30, 38, 55, 56, and 58 switchable fabric

Rauscher '201 does not identically disclose the data storage devices connected to a switchable fabric as recited by claims 30, 38, 55, 56 and 58. Rather, in a first embodiment of

FIG. 1 Rauscher '201 merely discloses connectors 110, 120, 130 between the controller 175 and each of three groups of DASDs 310-380, 410-480, 510-580, respectively, and connectors 210, 220, 230 between the controller 275 and the three groups of DASDs, respectively. In a second embodiment of FIG. 2 Rauscher '201 merely discloses connectors 610, 710 between the controllers 175, 275 and the DASDs in a daisy-chain fashion. Rauscher '201 is wholly silent regarding the any of the connectors being a *switchable fabric*.

The Examiner views the claim term *fabric* as being anticipated by the connectors 110-130 and 210-230 of Rauscher '201. However, the skilled artisan readily recognizes that the term *switchable fabric* plainly means a computer network topology where many devices are interconnectable via switches to provide multipath redundancy in the signal paths between the devices. There is no question that the connectors 110-130, 210-230 in Rauscher '201 each provide only a single signal path between the devices. For example, in Rauscher '201 communication between the controller 175 and the DASDs 310-380 is via the connector 110. If the connector 110 fails, there is no other signal path between the controller 175 and the DASDs 310-380 to rely on.

These claim furthers particularly point out the multipath redundancy by reciting: *the storage controllers each selectively connectable to each of the plurality of data storage devices via a switchable fabric (claim 30); a switchable fabric defining at least two independent signal paths between the storage controller and each data storage device (claim 38); a plurality of data storage locations that are accessible to an external device through a common connector via circuitry that comprises a switchable fabric (claim 55); a storage controller selectively connectable to each of a plurality of self-contained data storage*

devices via a switchable fabric; and instructions stored in memory and executable by the storage controller for switching the fabric (claim 58).

The Examiner asserts Applicant's own description of the term *fabric* from the specification. This is not necessary because *fabric* is a term of art with plain meaning that is within the knowledge of the skilled artisan. Nevertheless, even the passage of the specification cited by the Examiner weighs in favor of the conclusion that the connectors 110-130, 210-230 in Rauscher '201 do not identically disclose the *fabric* of the present embodiments:

The fabric may comprise any device or devices capable of configurably interconnecting data storage devices to one or more controllers and may comprise multiplexers, cross point switches, port bypass controllers. Fabrics may also provide translation or conversion of one bus or interface format to another format.

(Office Action of 10/16/2006, pg. 3)

The skilled artisan readily recognizes that the connectors 110-130, 210-230 are not in any way capable of "configurably interconnecting" the data storage devices to the controllers. For clarification sake, "configuring" the fabric is also discussed in the specification; for example:

Computer program code operating in a host system and/or one or more interface controllers, and/or one or more disc controllers is employed to configure fabrics of the present invention. Fabrics may be controlled by computer program code operating in one or more host computers. Such program code may include performance monitoring and load balancing functions. Configuration of fabrics may be performed as a result of a detected failure, or in response to other conditions including load, data type, data size, data storage format, desired response time, etc. as may reflect services provided such as transaction processing, or video streaming, for example. One or more disc controllers may control fabrics. Computer program code operating in a disc controller may configure fabrics in response to a failure or

other condition. Configuration of fabrics may be shared between one or more host computers and one or more disc controllers. As previously noted, switch control may employ one or more control buses, such as I2C, may employ one or more disc buses, or both. Fabrics may be mapped as a device on one or more disc array buses and control signals for one or more fabrics may be conveyed across the disc array bus or buses. Some of the figures depict a separate switch control block. In some embodiments the switch control block may be a part of the fabric.
(specification, paragraph [0046], emphasis added)

Rauscher '201 is wholly silent regarding interconnecting the data storage devices and the controllers with a *fabric*. In fact, the entire disclosure of Rauscher '201 neither contains the term "fabric" nor suggests its use. The Examiner's claim construction is fundamentally flawed for not using the plain meaning of the term *fabric*. Furthermore, in the absence of any evidence as to how the connectors 110-130, 210-230 are capable of "configurably interconnecting" the DASDs and the controllers in Rauscher '201, it can only be concluded that the rejection is based upon a mischaracterization of what Rauscher '201 actually discloses.

The Examiner's claim construction is unreasonably broad because it ignores the plain meaning of *fabric* that is consistent with its usage in the specification, thereby effectively ignoring explicitly recited claim language. *In re Morris* The examination resulting in this rejection is incomplete with regard to the Examiner's obligation to consider the patentability of the invention as claimed. 37 CFR 1.104(a)(1). Also, because the rejection is based on ignoring an explicitly recited feature and mischaracterizing the cited reference, the Examiner does not provide a reason for the rejection that is useful in aiding Applicant to judge the propriety of continuing the prosecution. 37 CFR 1.104(a)(2)

The Examiner has failed to make the requisite prima facie case of anticipation by not

substantiating evidence in the record that the cited reference identically discloses all the features recited by the language of claims 30, 38, 55, 56 and 58. Therefore, any next rejection of these claims cannot be made final. Reconsideration and withdrawal of the rejection of claims 30, 38, 55, 56, and 58 and the claims depending therefrom are respectfully requested.

Claim 53 - means for controlling

Rauscher '201 does not identically disclose the *means for controlling* of claim 53. Claim 53 is written in accordance with 35 U.S.C. §112, sixth paragraph. The Examiner is obliged as a matter of law to construe this means element as the disclosed structure, and equivalents thereof, that are capable of the identical function. See *B. Braun Medical, Inc. v. Abbott Lab.*, 43 USPQ2d 1896, 1900 (Fed. Cir. 1997); *In re Donaldson Co. Inc.*, 26 USPQ2d 1845 (Fed. Cir. 1994)(*en banc*); *In re Dossel*, 42 USPQ2d 1881 (Fed. Cir. 1997); *Supplemental Examination Guidelines for Determining the Applicability of 35 U.S.C. 112, Para. 6*, 65 FR 38510. Here, the Examiner simply points to FIG. 1 of Rauscher '201 as the basis for the rejection. The Examiner's failure to construe claim 53 in accordance with Section 112 paragraph six constitutes reversible error in and of itself.

Nonetheless, Applicant has identified the function associated with the recited "means" element as being multipath redundancy in the I/O communications between an external device and the storage space through a particular controller. As discussed above, the connectors 110-130, 210-230 of FIG. 1 are inherently incapable of multipath redundancy. When this claim is properly construed in accordance with Section 112 paragraph six it will be concluded that Rauscher '201 does not identically disclose the *means for controlling*.

The examination resulting in this rejection is incomplete with regard to the Examiner's obligation to consider the patentability of the invention as claimed. 37 CFR 1.104(a)(1). Also, because the rejection is not based on a claim construction in accordance with Section 112 paragraph six, the Examiner does not provide a reason for the rejection that is useful in aiding Applicant to judge the propriety of continuing the prosecution. 37 CFR 1.104(a)(2)

The Examiner has failed to make the requisite prima facie case of anticipation by not substantiating evidence in the record that the cited reference identically discloses all the features recited by the language of claim 53. Therefore, any next rejection of this claim cannot be made final. Reconsideration and withdrawal of the rejection of claim 53 are respectfully requested.

Claim 54 - two independent signal paths

As discussed above, Rauscher '201 does not identically disclose *a plurality of data storage locations that are accessible to each of a plurality of controllers via circuitry that defines at least two independent signal paths* as recited by the language of claim 54.

In rejecting this claim the Examiner simply points to FIG. 1 of Rauscher '201. However, again the connectors 110-130, 210-230 of Rauscher '201 each provide only a single signal path. The Examiner has provided no evidence in the record explaining how any data storage location is accessible to each of a plurality of controllers via at least two independent signal paths. For example, FIG.1 of Rauscher '201 clearly shows that the DASDs 310-380 are only accessible to each controller 175, 275 via one signal path. That is, DASDs 310-380 are accessible to controller 176 only via connector 110, and are accessible

to controller 275 only via connector 210. The DASDs 310-380 are not accessible to either controller 175, 275 via two independent signal paths. The same is true for the other DASDs as well.

The cited reference cannot sustain a prima facie case of anticipation because it does not identically disclose all the features recited by the language of claim 54. Reconsideration and withdrawal of the rejection of claim 54 are respectfully requested.

Rejection Under Section 102

Claims 38, 39, 41, 47-49, 53-56, 58, and 59 stand rejected as being anticipated by US 2004/0139260 to Steinmetz ("Steinmetz '260"). This rejection is respectfully traversed.

Claims 38, 47, 55, 56, 58, and 59 - switchable fabric

Steinmetz '260 does not identically disclose data storage devices connected to a switchable fabric as recited by claims 38, 47, 55, 58, and 59. Rather, FIG. 10 of Steinmetz '260 depicts the controller 1006 connected to shelf routers 1014, 1018 via a fibre channel arbitrated loop. The shelf routers 1014, 1018 are, in turn, connected to each of the disk drives 1022-1025 via point-to-point serial links. The skilled artisan readily recognizes that neither the FC arbitrated loop topology nor the point-to-point serial links require any fibre channel switches, and a plain reading of the cited reference reveals that none are disclosed.

In each of these rejections the Examiner simply points to FIG. 10 of Steinmetz '260, without comment, as anticipating the switchable fabric of the present embodiments as claimed. However, neither the fibre channel arbitrated loop nor the point-to-point serial links in FIG. 10 identically discloses the switchable fabric of the present embodiments as claimed.

Steinmetz '260 is wholly silent regarding interconnecting the data storage devices and the controllers with a *switchable fabric*. In the total absence of any evidence, much less any explanation, as to how the structure of FIG. 10 anticipates the *switched fabric* of the present embodiments, it can only be concluded that the rejection is based upon a mischaracterization of what Steinmetz '260 actually discloses.

The Examiner's claim construction is unreasonably broad because it ignores the plain meaning of *switched fabric* that is consistent with its usage in the specification, thereby effectively ignoring explicitly recited claim language. *In re Morris* The examination resulting in this rejection is incomplete with regard to the Examiner's obligation to consider the patentability of the invention as claimed. 37 CFR 1.104(a)(1). Also, because the rejection is based on ignoring an explicitly recited feature and mischaracterizing the cited reference, the Examiner does not provide a reason for the rejection that is useful in aiding Applicant to judge the propriety of continuing the prosecution. 37 CFR 1.104(a)(2)

The Examiner has failed to make the requisite prima facie case of anticipation by not substantiating evidence in the record that the cited reference identically discloses all the features recited by the language of claims 38, 47, 55, 56, 58 and 59. Therefore, any next rejection of these claims cannot be made final. Reconsideration and withdrawal of the rejection of claims 38, 47, 55, 56, 58, and 59 and the claims depending therefrom are respectfully requested.

Claim 53 - means for controlling

Steinmetz 260 does not identically disclose the *means for controlling* of claim 53. Claim 53 is written in accordance with 35 U.S.C. §112, sixth paragraph. The Examiner is

obliged as a matter of law to construe this means element as the disclosed structure, and equivalents thereof, that are capable of the identical function. See *B. Braun Medical, Inc. v. Abbott Lab.*, 43 USPQ2d 1896, 1900 (Fed. Cir. 1997); *In re Donaldson Co. Inc.*, 26 USPQ2d 1845 (Fed. Cir. 1994)(*en banc*); *In re Dossel*, 42 USPQ2d 1881 (Fed. Cir. 1997); *Supplemental Examination Guidelines for Determining the Applicability of 35 U.S.C. 112, Para. 6*, 65 FR 38510. Here, the Examiner simply points to FIG. 10 of Steinmetz '260 as the sole basis for the rejection. The Examiner's failure to construe claim 53 in accordance with Section 112 paragraph six constitutes reversible error in and of itself.

Nonetheless, Applicant has identified the function associated with the recited "means" element as being multipath redundancy in the I/O communications between an external device and the storage space through a particular controller. The disclosed structure providing the multipath redundancy is switched fabric or switching device(s) in combination with a fabric. Neither the fibre channel arbitrated loop nor the discrete point-to-point serial connections of Steinmetz '260 are structurally equivalent to the disclosed structure. When this claim is properly construed in accordance with Section 112 paragraph six it will be concluded that Rauscher '201 does not identically disclose the *means for controlling*.

The examination resulting in this rejection is incomplete with regard to the Examiner's obligation to consider the patentability of the invention as claimed. 37 CFR 1.104(a)(1). Also, because the rejection is not based on a claim construction in accordance with Section 112 paragraph six, the Examiner does not provide a reason for the rejection that is useful in aiding Applicant to judge the propriety of continuing the prosecution. 37 CFR 1.104(a)(2)

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The Examiner has failed to make the requisite prima facie case of anticipation by not substantiating evidence in the record that the cited reference identically discloses all the features recited by the language of claim 53. Therefore, any next rejection of this claim cannot be made final. Reconsideration and withdrawal of the rejection of claim 53 are respectfully requested.

Claim 54

Claim 54 has been amended to more particularly point out and distinctly claim *a plurality of data storage locations that are accessible to each of a plurality of controllers via circuitry that defines at least two independent signal paths between each location and each controller*. Reconsideration and withdrawal of the rejection of claim 54 are respectfully requested.

Rejection Under Section 103

Claims 35 and 43 stand rejected as being unpatentable over Rauscher '201 in view of Grieshaber '106. Applicant respectfully traverses this rejection.

These claims are allowable because Grieshaber '106 fails to cure the deficiencies of Rauscher '201 detailed above, and because they depend from an allowable independent claim, for reasons above, and recite additional limitations thereto.

Reconsideration and withdrawal of the rejection of claims 35 and 43 are respectfully requested.

Rejection Under Section 103

Claims 50-52, and 57 stand rejected as being unpatentable over Steinmetz '260 in view of Pignolet '828. Applicant respectfully traverses this rejection.

Claims 50-52 are allowable because Pignolet '828 fails to cure the deficiencies of Steinmetz '260 that are detailed above, and because they depend from an allowable independent claim, for reasons above, and recite additional limitations thereto. Reconsideration and withdrawal of the rejection of claims 50-52 are respectfully requested.

As for claim 57, the Examiner has failed to substantiate a *prima facie* case of obviousness because Steinmetz '260 does not teach or suggest *a first switchable fabric* and *a second switchable fabric* as claimed. As discussed above, Steinmetz '260 discloses a fibre channel arbitrated loop connecting the controller to the shelf routers, and discrete point-to-point serial links between the shelf routers and the data storage devices. Neither the arbitrated loop nor the serial links requires fibre channel switches as in the present embodiments as claimed, and none are identically disclosed in Steinmetz '260.

No *prima facie* case of obviousness has been made because neither Steinmetz '260 nor Pignolet '828, alone or together, teach or suggest all the features of the present embodiments as claimed. Reconsideration and withdrawal of the rejection of claim 57 are respectfully requested.

Conclusion

This is a complete response to the Office Action mailed October 16, 2006.

Applicant has also filed a request for telephone interview in the absence of all

pending claims passing to allowance. The telephone interview is necessary to reconcile what are clearly discrepant views held by Applicant and the Examiner regarding the merits of this application in view of the cited art.

Respectfully submitted,

By: 

Mitchell K. McCarthy, Registration No. 38,794
McCarthy & Associates
500 West Main Street, Suite 609
Oklahoma City, Oklahoma 73102
Telephone: (405) 601-2798
Facsimile: (405) 601-2853

Applicant Initiated Interview Request Form

Application No.: 10 /817,565 First Named Applicant: David Peter DeCenzo
 Examiner: Gabriel L. Chu Art Unit: 2114 Status of Application: Pending

Tentative Participants:

(1) Examiner Chu (2) Mitchell K. McCarthy

(3) _____ (4) _____

Proposed Date of Interview: To be determined by Examiner Proposed Time: _____ (AM/PM)

Type of Interview Requested:

(1) ☒ Telephonic (2) ☐ Personal (3) ☐ Video Conference

Exhibit To Be Shown or Demonstrated: ☐ YES ☒ NO

If yes, provide brief description: _____

Issues To Be Discussed

Issues (Rej., Obj., etc)	Claims/ Fig. #s	Prior Art	Discussed	Agreed	Not Agreed
(1) <u>Rej.</u>	<u>30</u>	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(2) <u>Rej.</u>	<u>38</u>	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(3) <u>Rej.</u>	<u>47</u>	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(4) <u>Rej.</u>	<u>53-59</u>	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Continuation Sheet Attached					

Brief Description of Arguments to be Presented:

Interview is necessary to resolve issues regarding the unsubstantiated rejections in the first Office Action.

An interview was conducted on the above-identified application on _____.

NOTE: This form should be completed by applicant and submitted to the examiner in advance of the interview (see MPEP § 713.01).

This application will not be delayed from issue because of applicant's failure to submit a written record of this interview. Therefore, applicant is advised to file a statement of the substance of this interview (37 CFR 1.133(b)) as soon as possible.

 Applicant/Applicant's Representative Signature

Mitchell K. McCarthy

Typed/Printed Name of Applicant or Representative

38,794

Registration Number, if applicable

 Examiner/SPE Signature

This collection of information is required by 37 CFR 1.133. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 123 and 37 CFR 1.11 and 1.14. This collection is estimated to take 21 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.